COLLABORATIVE PROJECT WITH INTEL

PROJECT TITLE : Accident Location on Indian Roads

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ABSTRACT: The project report focuses on analyzing accident locations on Indian roads and developing strategies to mitigate road accidents. Road accidents in India are a major concern, leading to numerous fatalities and injuries annually.

Understanding the specific locations where accidents occur and identifying contributing factors is crucial for implementing effective road safety measures. This report presents a comprehensive analysis of accident data, including urban areas, highways, junctions, poorly maintained roads, and pedestrian zones. Factors such as speeding, reckless driving, drunk driving, distracted driving, and inadequate infrastructure are identified as significant contributors to accidents.

To address these challenges, the report proposes strategies such as infrastructure improvement, speed management, driver education and training, public awareness campaigns, and data-driven interventions. By implementing these strategies, it is expected that road safety can be enhanced, leading to a reduction in accidents and a safer transportation system in India.

By using Streamlit a python module for web development and some modules like Pandas, Matplotlib, Numpy for visualization of data. We have completed the project and hosted it on the web.You can check here(**https://accidentsinindia.streamlit.app/**). We also referred some QGIS to complete this project.

Keywords: Road accidents, Black Spots, Locations, Road safety, QGIS, Streamlit.

INTRODUCTION

Road accidents are a persistent and significant problem in India, resulting in a high number of fatalities, injuries, and economic losses each year. The Indian road network, being one of the largest in the world, spans diverse landscapes and accommodates a vast volume of vehicles, including cars, motorcycles, buses, and trucks. However, the rapid growth in vehicle ownership and inadequate infrastructure development have contributed to increased road accidents.

The aim of this project report is to analyze and present findings on accident locations on Indian roads basically known as Blackspots. This knowledge will serve as a foundation for proposing strategies and interventions that can be implemented to enhance road safety across the country.

The report will utilize comprehensive accident data collected from reliable sources, including government records, police reports, and accident databases. Advanced analytical techniques will be applied to identify accident hotspots, trends, and patterns. The evaluation of various factors, such as road design, traffic volume, infrastructure quality, and geographical features, will help in pinpointing areas of concern.

MOTIVATION

The motivation behind this project is to address the pressing issue of road traffic accidents in India. By analyzing accident locations and identifying contributing factors, we aim to develop targeted interventions and policies to improve road safety. Our goal is to save lives, reduce injuries, and alleviate the economic burden associated with accidents. Through comprehensive analysis and evidence-based recommendations, we strive to create a safer future where individuals can travel with confidence and security.

By understanding the spatial patterns and factors contributing to accidents on Indian roads, we can prioritize interventions and allocate resources effectively. This project aims to provide valuable insights to policymakers and transportation authorities, leading to proactive measures that will ultimately reduce road traffic accidents and enhance the safety of Indian roads.

The Intel Industrial Training initiative Unnati Program helps the students in getting the flavor of Industrial View of the work planning, interaction and guidance of Intel Team and friendly competition with other college students.

DATA SOURCES

Downloaded and analyzed the accident locations India at specific locations using (morth.nic.in/black-spot) website these are the blackspots provided by the Indian government.

We have taken data with coordinates from given websites and all are converted to csv format.

Developed code to take the input from the given datasets and it plots using the coordinates.

Developed a code for visualizing the data using Bar plots, Metadata etc…

PYTHON LIBRARIES USED IN THE PROGRAMS

Streamlit: The Streamlit module in Python is a powerful tool for quickly creating interactive web-based data visualizations and applications, allowing developers to seamlessly share their data insights with others.

Numpy: NumPy is a library for the Python programming language, adding support for large, multi-dimensional arrays and matrices, along with a large collection of high-level mathematical functions to operate on these arrays.

Plotly: The Plotly module in Python offers a versatile and interactive data visualization library, enabling developers to create visually stunning and customizable plots, charts, and graphs for effective data exploration and storytelling.

Seaborn: The Seaborn module in Python provides a high-level interface for creating visually appealing and informative statistical graphics, allowing users to effortlessly generate beautiful visualizations with minimal code and maximum impact.

Matplotlib: The Matplotlib module in Python is a widely-used plotting library that allows developers to create a wide range of static, animated, and interactive visualizations, making it a versatile tool for data exploration and presentation.

Pandas: It is a Python library used for working with data sets. It has functions for analyzing, cleaning, exploring, and manipulating data. The name "Pandas" has a reference to both "Panel Data", and "Python Data Analysis".

RESULTS

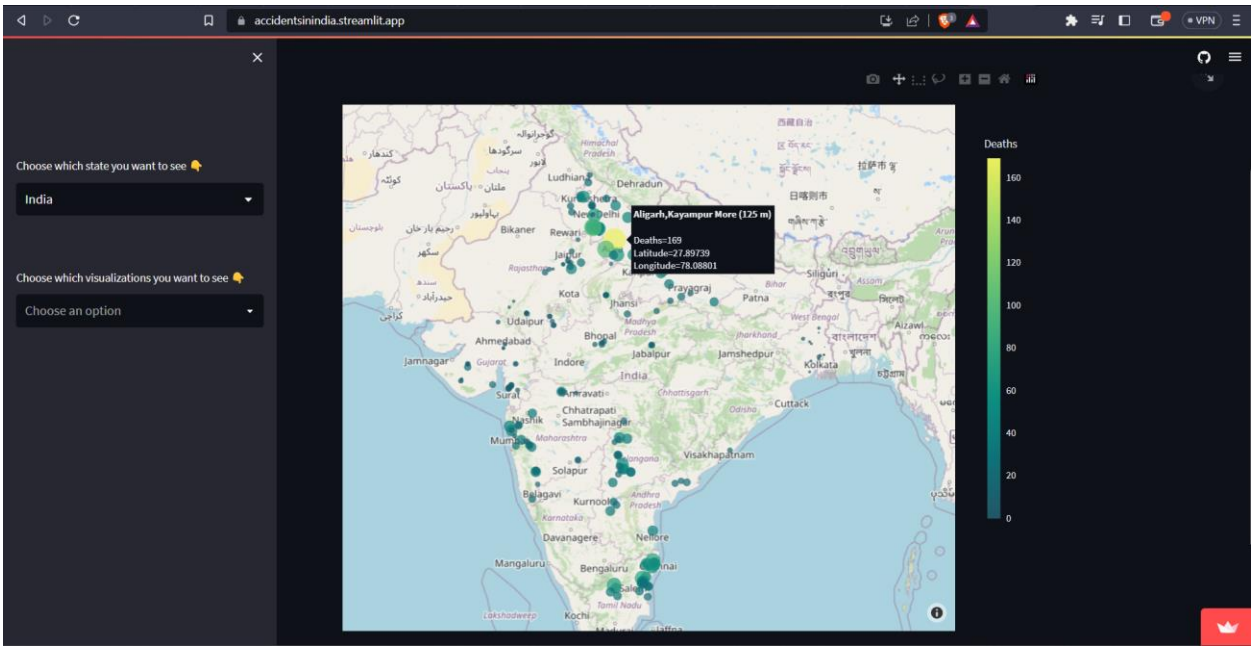

Fig 1: Map of accident locations in India

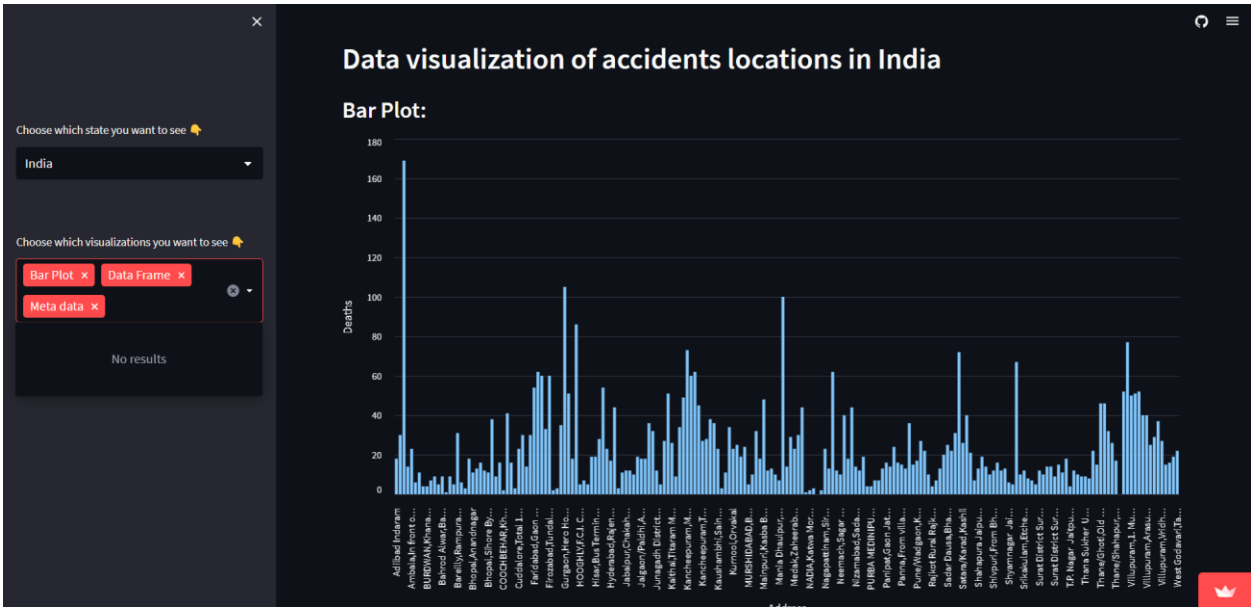

Fig 2: Bar Plot for Data Visualization

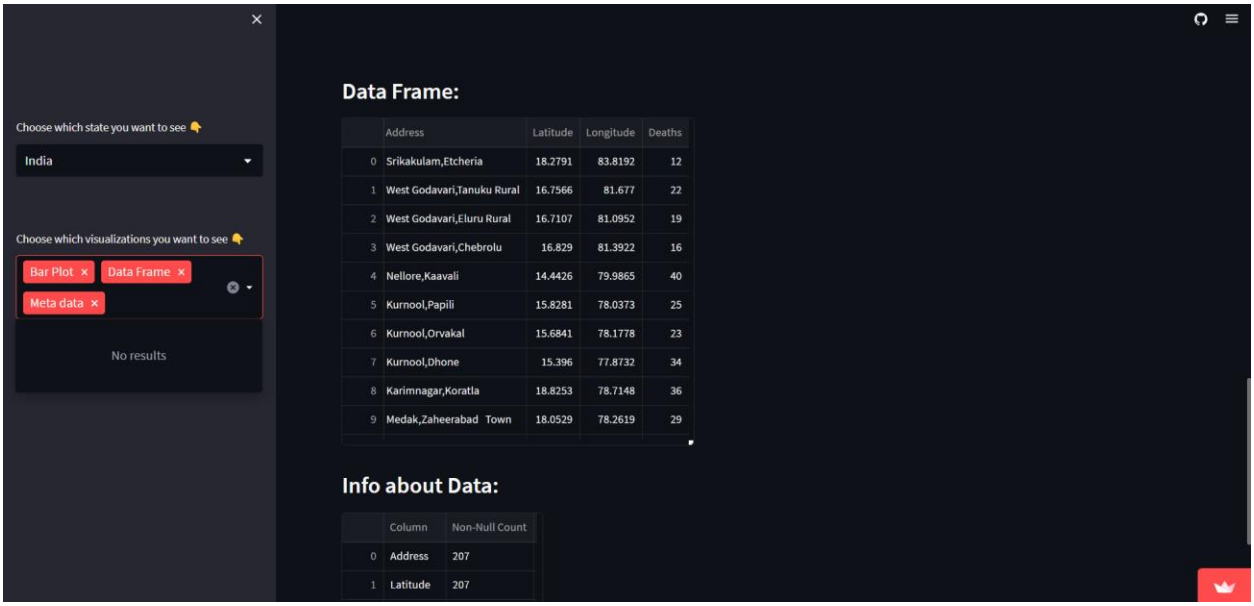

Fig 3: Data Frame for Data Visualization

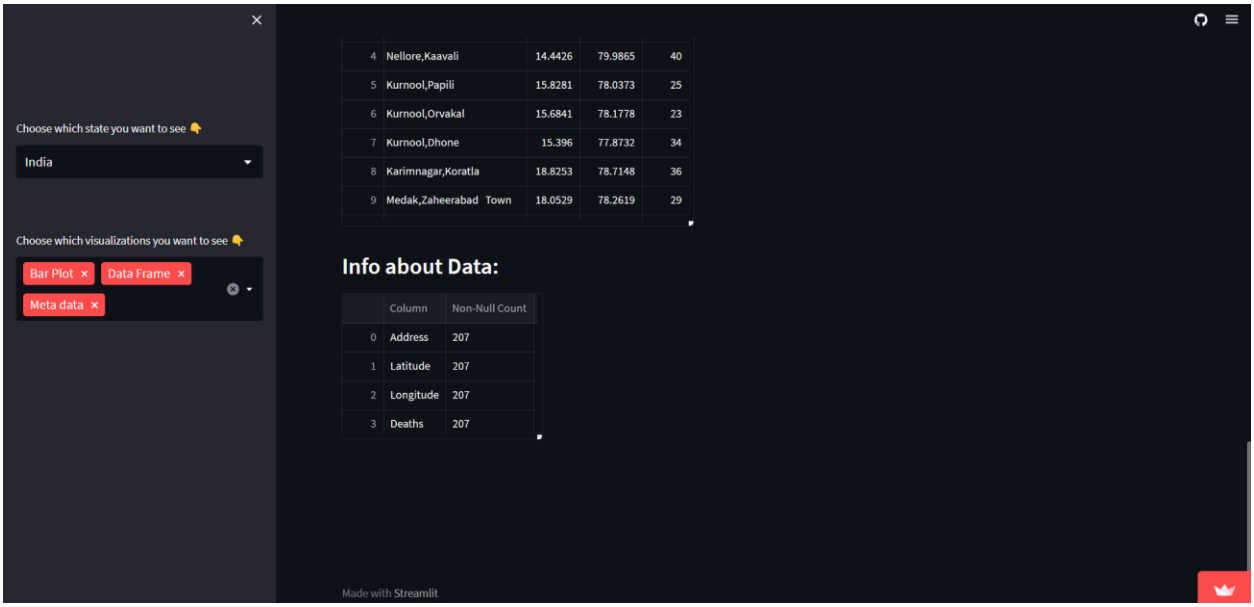

Fig 4: Metadata for Data Visualization

CONCLUSION

In conclusion, this project has provided valuable insights into accident locations on Indian roads by analyzing spatial patterns and identifying contributing factors. The findings offer actionable information for policymakers and transportation authorities to prioritize interventions effectively, focusing on high-risk areas and addressing variables such as road infrastructure, traffic density, weather conditions, and driver behavior. By leveraging advanced analytical techniques, we can work towards reducing road traffic accidents, fostering safer travel, and creating a more resilient society in India.

FUTURE SCOPE

The product can be extended into developing apps to identify dangerous locations and warn the drivers to alert to the road conditions and in case of accidental cases, identifying the nearby hospitals, police stations. In conclusion, It can be extended to use the QGIS tools.

REFERENCES

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SOURCE CODE AND CONFIGURATION FILES

github.com/Pavan-0004/Accident-Location-on-Indian-Roads

URL

https://accidentsinindia.streamlit.app/